AMENDMENTS TO THE CLAIMS:

1. (Currently amended) ~~A silicon dual inertial sensors, including both functions of a rotation-rate sensor and an acceleration sensor, whose structure is made of a (110) silicon chip with bulk-micromachining method, and is in a form of parallelogram, wherein said structure is further comprising an outer frame, including a first and a second inner frame, a central anchor and a plurality of connecting blocks; each inner frame comprises a proof mass, which is connected to said inner frame with a plurality of sensing resilient beams, and said inner frame is connected to said outer frame with a plurality of driving resilient beams, or connected to two common connection beams which are positioned at both sides of the proof masses and then connected to said central anchor with the common resilient beam; said structure also comprises two sheets on the front side and back side of said silicon chip, and said sheets are connected to said outer frame, said central anchor and said connecting blocks; wherein said sensing beams make it easier for said proof masses to move perpendicular to the surface of said silicon chip (defined as z-axis), and said driving beams make it easier for said inner frames to move in parallel with the surface of said silicon chip (defined as y-axis); the sides of said inner frames which are perpendicular to the y-axis are driver body, whose surface comprises a plurality of long trenches or slits perpendicular to the y-axis; the surface of each said sheet corresponding to each said driver body comprises two sets of stripe electrodes which are interposed to each other and in parallel to said long trenches or slits, and thereof being formed two sets of driving capacitors with the corresponding surface of the driver body; the surface of~~

~~each said sheet corresponding to each said proof-mass is electroplated with a metal thin-film electrode, which form sensing capacitor with the surface of said proof-mass; when an oscillating signal with proper phase imposed on each said driving capacitors will generate an electrostatic force to make said first inner frame and said second inner frame to move in opposite direction along the y-axis, and also move proof-mass in the opposite direction along the y-axis, if there is a rotation rate Ωalong the x-axis, it will generates a Coriolis force to make said proof-masses to move in the opposite direction of the z-axis; if an acceleration is input along the z axis, the specific force will move said proof-masses with the same direction; when said proof-masses move or oscillate, the capacitance of the sensing capacitor will change due to the change of the capacitor's distance; hence the moving distance can be obtained by measuring the change of capacitance; as the rotation rate outputs an alternating signal, and acceleration outputs a direct signal, they can be separated with signal processing.~~

A silicon dual inertial sensor having a structure made of a (110) silicon chip with a bulk-micromachining method in a form of a parallelogram, said structure comprising:

an outer frame;

a central anchor;

a plurality of connecting blocks;

a first inner frame and a second inner frame each having a plurality of sensing beams connected to a proof-mass, and a plurality of driving beams connected to said outer frame or two common connection beams positioned at two sides of said proof-mass and then connected to said central anchor with a plurality of common supporting

beams, each side of said first or second inner frame perpendicular to a y-axis forming a driver body which has a plurality of long trenches or slits formed perpendicular to the y-axis on each surface, said y-axis being in parallel with a surface of said silicon chip; and

two insulation sheets connected to said outer frame, said central anchor and said connecting blocks, said insulation sheets being positioned respectively on a front side and a back side of said silicon chip, each insulation sheet having a plurality of metal thin film electrodes each being formed corresponding to a surface of a proof-mass of said first or second inner frame to form a sensing capacitor, and a plurality of electrode surface areas each being formed with two sets of stripe electrodes corresponding to a driver body of said first or second inner frame, said two sets of stripe electrodes being interposed to each other and in parallel to said long trenches or slits of the corresponding driver body to form two sets of driving capacitors;

wherein an electrostatic force is generated to make the proof-mass of said first inner frame and the proof-mass of said second inner frame move in opposite directions along said y-axis when an oscillating signal with a proper phase is imposed on each of said driving capacitors, a Coriolis force is generated to make the proof-mass of said first inner frame and the proof-mass of said second inner frame move in opposite directions along a z-axis perpendicular to the surface of said silicon chip when a rotation rate exists along an x-axis in parallel with the surface of said silicon chip, and

the proof-mass of said first inner frame and the proof-mass of said second inner frame move in a same direction along said z-axis when an acceleration exists along said z-axis.

2. (Currently Amended) A silicon dual inertial sensor ~~sensors~~ as in Claim 1, wherein the front and back surfaces of said proof-mass ~~proof-masses~~ comprise a plurality of bumps each with an ~~or long convex and its~~ insulation layer to prevent stickiness problem between said proof-mass and said [[glass]] insulation sheets.

3. (Currently Amended) A silicon dual inertial sensor ~~sensors~~ as in Claim 1, wherein the front and back surfaces of said proof-mass ~~proof-masses~~ comprise a plurality of long recessed areas ~~concave~~ or slits parallel to any side of said proof-mass to reduce [[the]] air resistance when said proof-mass vibrates ~~vibrate~~ along the z-axis.

4. (Currently Amended) A silicon dual inertial sensor ~~sensors~~ as in Claim 1, wherein the surfaces of said outer frame, said connecting blocks ~~block~~ or said central anchor comprise at least a ~~concave, whose corresponding glass sheet is electroplated with a metal thin film electrode,~~ recessed area, and a corresponding metal thin film electrode is electroplated on said insulation sheets to form a temperature sensing capacitor~~; because its location is not affected by inertial force, and its capacitance is only affected by temperature, said capacitor can be used to compensate the effect of temperature on said dual inertial sensors~~.

5. (Currently Amended) A silicon dual inertial sensor ~~sensors~~ as in Claim 2, wherein the front and back surfaces of said proof-mass comprise a plurality of long recessed areas

~~concave~~ or slits parallel to any side of said proof-mass to reduce [[the]] air resistance when said proof-mass vibrates ~~vibrate~~ along the z-axis.

6. (Currently Amended) A silicon dual inertial sensor ~~sensors~~ as in Claim 2, wherein the surfaces of said outer frame, said connecting blocks ~~block~~ or said central anchor comprise at least a ~~concave, whose corresponding glass sheet is electroplated with a metal thin film electrode,~~ recessed area, and a corresponding metal thin film electrode is electroplated on said insulation sheets to form a temperature sensing capacitor~~; because its location is not affected by inertial force, and its capacitance is only affected by temperature, said capacitor can be used to compensate the effect of temperature on said dual inertial sensors~~.

7. (Currently Amended) A silicon dual inertial sensor ~~sensors~~ as in Claim 3, wherein the surfaces of said outer frame, said connecting blocks ~~block~~ or said central anchor comprise at least a ~~concave, whose corresponding glass sheet is electroplated with a metal thin film electrode,~~ recessed area, and a corresponding metal thin film electrode is electroplated on said insulation sheets to form a temperature sensing capacitor~~; because its location is not affected by inertial force, and its capacitance is only affected by temperature, said capacitor can be used to compensate the effect of temperature on said dual inertial sensors~~.

8. (Currently Amended) A silicon dual inertial sensor ~~sensors~~ as in Claim 1, wherein the front and back surfaces of said proof-mass comprise a plurality of bumps each with an ~~or long convex and its~~ insulation layer to prevent stickiness problem between said proof-mass and said [[glass]] insulation sheets; the front and back surfaces of said

proof-mass comprise a plurality of long recessed areas ~~concave~~ or slits parallel to any side of said proof-mass to reduce [[the]] air resistance when said proof-mass ~~vibrate~~ vibrates along the z-axis; and the surfaces of said outer frame, said connecting blocks ~~block~~ or said central anchor comprise at least a ~~concave, whose corresponding glass sheet is electroplated with a metal thin film electrode,~~ recessed area, and a corresponding metal thin film electrode is electroplated on said insulation sheets to form a temperature sensing capacitor~~; because its location is not affected by inertial force, and its capacitance is only affected by temperature, said capacitor can be used to compensate the effect of temperature on said dual inertial sensors~~.

9. (Currently Amended) A silicon dual inertial sensor as in Claim 1, wherein the surface of each of said insulation sheets ~~said sheet~~ corresponding to each of said proof-mass comprises a metal thin film sensing electrode and a metal thin film electrode for a gyroscope feedback driver.

10. (Currently Amended) ~~A silicon dual inertial sensors, including both functions of a rotation rate sensor and an acceleration sensor, whose structure is made of a conductive material, wherein said structure is further comprising an outer frame, including at least an accelerometer, an anchor and a plurality of connecting blocks; each accelerometer comprises an inner frame and an proof-mass, which is connected to said inner frame with a plurality of sensing resilient beams, and said inner frame is connected to said outer frame with a plurality of driving resilient beams, or connected to two common connection beams, which are positioned at both sides of the proof masses and then connected to said central anchor with the common resilient beam ;~~

~~said structure also comprises two sheets on the front side and back side of said silicon chip, and said sheets are connected to said outer frame, said anchors and said connecting blocks; wherein said sensing beam makes it easier for said proof mass to move perpendicular to the surface of said silicon chip (defined as z axis), and said driving beams makes it easier for said inner frame to move in parallel with the surface of said silicon chip (defined as y-axis); the sides of said inner frame which are perpendicular to the y-axis are driver body, whose surface comprises a plurality of long concave or slits perpendicular to the y-axis; the surface of each said sheet corresponding to each said driver body comprises two sets of stripe electrodes which are interposed to each other and in parallel to said long trenches or slits, and thereof being formed two sets of driving capacitors with the corresponding surface of the driver body; when an oscillating signal with proper phase imposed on each said driving capacitors will generate a electrostatic force to make said first inner frame and said second inner frame to move in opposite direction along the y-axis, and also move proof-masses in the opposite direction along the y-axis, if there is a rotation rate Ω along the x-axis, it will generates a Coriolis force to make said proof masses to move in the opposite direction of the z-axis; if an acceleration is input along the z-axis, the specific force will move said proof-masses with the same direction; when said proof-mass move or oscillate, the said accelerometers output signals; as the rotation rate outputs an alternating signal, and acceleration outputs a direct signal, they can be separated with signal processing.~~

A dual inertial sensor having a structure made of a conductive material, said structure comprising:

an outer frame;

a central anchor;

a plurality of connecting blocks;

a first accelerometer and a second accelerometer each comprising an inner frame having a plurality of sensing beams connected to a proof-mass, and a plurality of driving beams connected to said outer frame, or two common connection beams positioned at two sides of said proof-mass and then connected to said central anchor with a plurality of common supporting beams, each side of said inner frame perpendicular to a y-axis forming a driver body which has a plurality of long trenches or slits formed perpendicular to the y-axis on each surface, said y-axis being in parallel with a surface of said conductive material; and

two insulation sheets connected to said outer frame, said central anchor and said connecting blocks, said insulation sheets being positioned respectively on a front side and a back side of said conductive material, each insulation sheet having a plurality of electrode surface areas each being formed with two sets of stripe electrodes corresponding to a driver body of said inner frame, said two sets of stripe electrodes being interposed to each other and in parallel to said long trenches or slits of the corresponding driver body to form two sets of driving capacitors;

wherein an electrostatic force is generated to make the proof-mass of said first accelerometer and the proof-mass of said second accelerometer move in opposite

directions along said y-axis when an oscillating signal with a proper phase is imposed on each of said driving capacitors, a Coriolis force is generated to make the proof-mass of said first accelcrometer and the proof-mass of said second accelerometer move in opposite directions along a z-axis perpendicular to the surface of said conductive material when a rotation rate exists along an x-axis in parallel with the surface of said conductive material, and the proof-mass of said first accelerometer and the proof-mass of said second accelerometer move in a same direction along said z-axis when an acceleration exists along said z-axis.

11. (Currently Amended) A ~~silicon~~ dual inertial sensor ~~sensors~~ as in Claim 10, wherein said structure is made of a (110) silicon chip with bulk-micromachining ~~bulk-micromachinging~~ methods~~, and which is~~ in a shape of a parallelogram.

12. (Currently Amended) A ~~silicon~~ dual inertial sensor ~~sensors~~ as in Claim 10, wherein the front and back surfaces of said proof-mass comprise a plurality of bumps ~~or long convex and its~~ each with an insulation layer to prevent stickiness problem between said proof-mass and said [[glass]] insulation sheets.

13. (Currently Amended) A ~~silicon~~ dual inertial sensor ~~sensors~~ as in Claim 10, wherein the front and back surfaces of said proof-mass comprise a plurality of long recessed areas ~~concave~~ or slits parallel to any side of said proof-mass to reduce [[the]] air resistance when said proof-mass vibrates ~~vibrate~~ along the z-axis.

14. (Currently Amended) A ~~silicon~~ dual inertial sensor ~~sensors~~ as in Claim 10, wherein the surfaces of said outer frame, said connecting blocks ~~block~~ or said central anchor

comprise at least a temperature sensor~~; because its location is not affected by inertial force, and its output is only affected by temperature, said temperature sensor can be used to compensate the effect of temperature on said dual inertial sensors~~.

15. (Currently Amended) A ~~silicon~~ dual inertial sensor ~~sensors~~ as in Claim 12, wherein the front and back surfaces of said proof-mass comprise a plurality of long recessed areas ~~concave~~ or slits parallel to any side of said proof-mass to reduce [[the]] air resistance when said proof-mass vibrates ~~vibrate~~ along the z-axis.

16. (Currently Amended) A ~~silicon~~ dual inertial sensor ~~sensors~~ as in Claim 12, wherein the surfaces of said outer frame, said connecting blocks ~~block~~ or said central anchor comprise at least a temperature sensor~~; because its location is not affected by inertial force, and its output is only affected by temperature, said temperature sensor can be used to compensate the effect of temperature on said dual inertial sensors~~.

17. (Currently Amended) A ~~silicon~~ dual inertial sensor ~~sensors~~ as in Claim 13, wherein the surfaces of said outer frame, said connecting blocks ~~block~~ or said central anchor comprise at least a ~~concave, whose corresponding glass sheet is electroplated with a metal thin film electrode,~~ recessed area, and a corresponding metal thin film electrode is electroplated on said insulation sheets to form a temperature sensing capacitor~~; because its location is not affected by inertial force, and its capacitance is only affected by temperature, said capacitor can be used to compensate the effect of temperature on said dual inertial sensors~~.

18. (Currently Amended) A ~~silicon~~ dual inertial sensor ~~sensors~~ as in Claim 10, wherein

the front and back surfaces of said proof-mass comprise a plurality of bumps each with an ~~or long~~ ~~convex and its~~ insulation layer to prevent stickiness problem between said proof-mass and said [[glass]] insulation sheets; the front and back surfaces of said proof-mass comprise a plurality of long recessed areas ~~concave~~ or slits parallel to any side of said proof-mass to reduce [[the]] air resistance when said proof-mass vibrates ~~vibrate~~ along the z-axis; and the surfaces of said outer frame, said connecting blocks ~~block~~ or said central anchor comprise at least a ~~concave, whose corresponding glass sheet is electroplated with a metal thin film electrode,~~ recessed area, and a corresponding metal thin film electrode is electroplated on said insulation sheets to form a temperature sensing capacitor~~; because its location is not affected by inertial force, and its capacitance is only affected by temperature, said capacitor can be used to compensate the effect of temperature on said dual inertial sensors~~.